OTC 8-Hour Ozone SIP Modeling Update

SIP Steering Committee
May 4, 2006

Presentation Topics

1. OTC Ozone SIP Modeling Platform

2. 2009 (ver.2) Base Case CMAQ Model Run

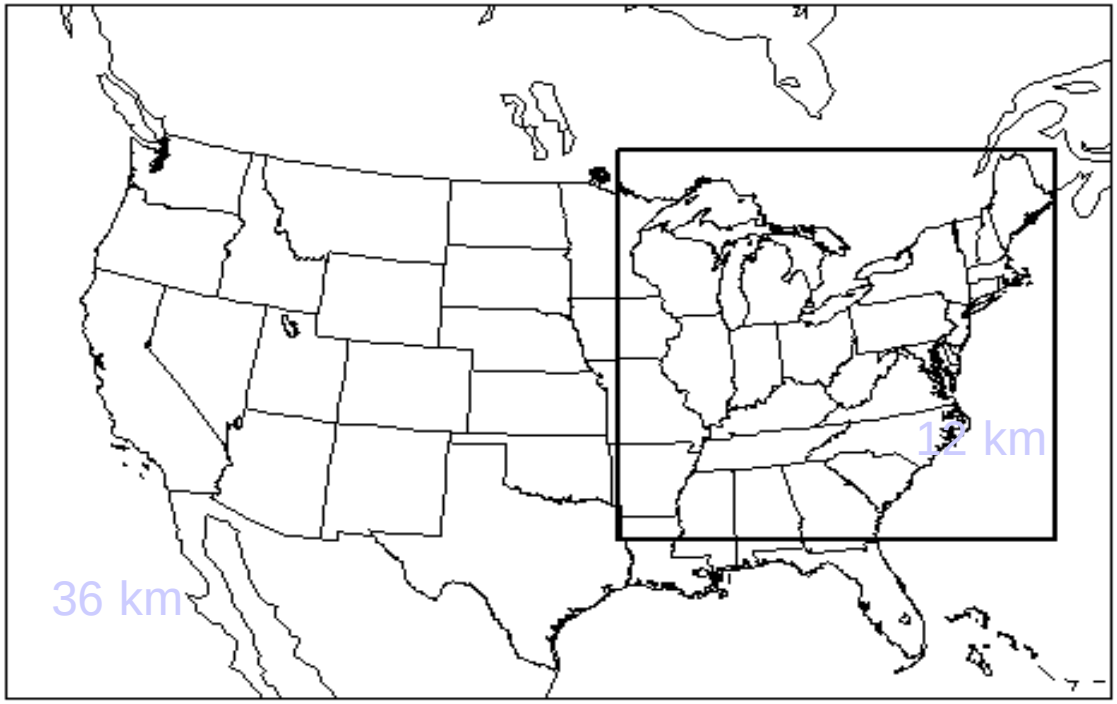
3. Next Steps

1. OTC Ozone SIP Modeling Platform

Background

- NYDEC set up the Ozone SIP modeling platform design and is performing CMAQ 4.4 modeling runs.
- UMD with support from MDE developed the meteorological fields for 2002 using MM5.
- MANEVU is working with contractor and MARAMA to prepare base case and future case emission files based on state emission inventories.

Modeling Domain



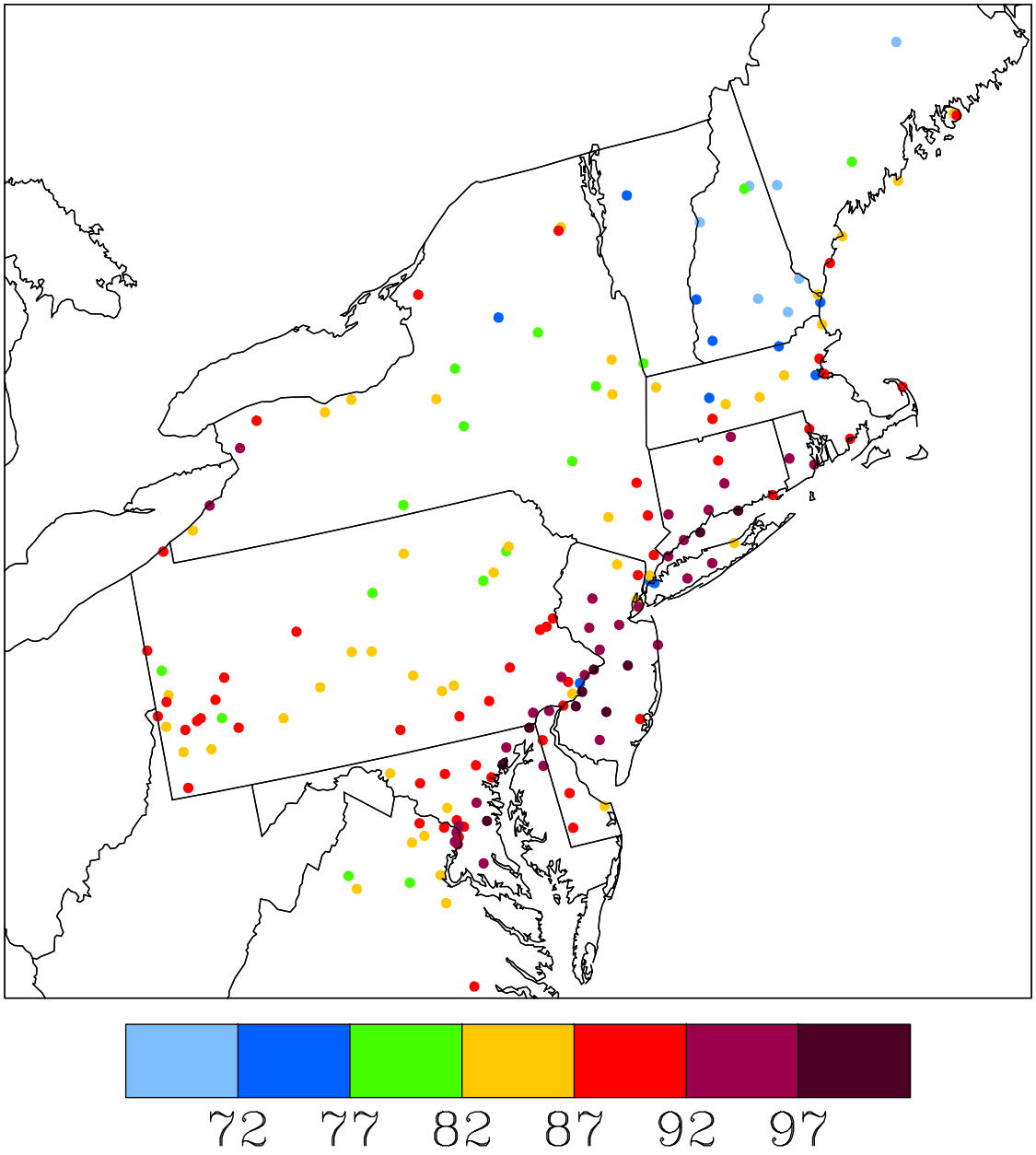
2. 2009 Base Case CMAQ Model Run

2002 Base Case Design Value (DV)

The 2002 base case ozone design value for each ozone monitor was determined by averaging the 8-hr ozone design values (dv) reported to EPA for three periods of time (2000-2002, 2001- 2003 and 2002-2004).

2002 DV = (2002dv+2003dv+2004dv)/3

2002 Design Values in OTR



The 2002 design values for OTC monitors is the average of the 8-hr ozone design values for the 2000-2002, 2001-2003, and the 2002-2004 three year periods

2009 Strategies: Base Case Control Programs

On the Books/On the Way including…

- NOx SIP Call, CAIR, State multi-P rules
- Federal onroad and offroad fuels, vehicle standards, LEV programs (if applicable)
- Federal MACT rules
- OTC existing model rules for Consumer Products, AIM, DG, etc.
- Any state-specific rules in effect by 2009

Relative Reduction Factors (RRF)

- For each high ozone day, the highest of 8-hour averages from the nine grid cells containing and surrounding each ozone monitor was selected.

- The average of these maximum daily values for both the 2002 base case and the 2009 control case was then determined.

- The RRF for each monitor was calculated by dividing the 2009 base case max daily average by the 2009 control case max daily average.

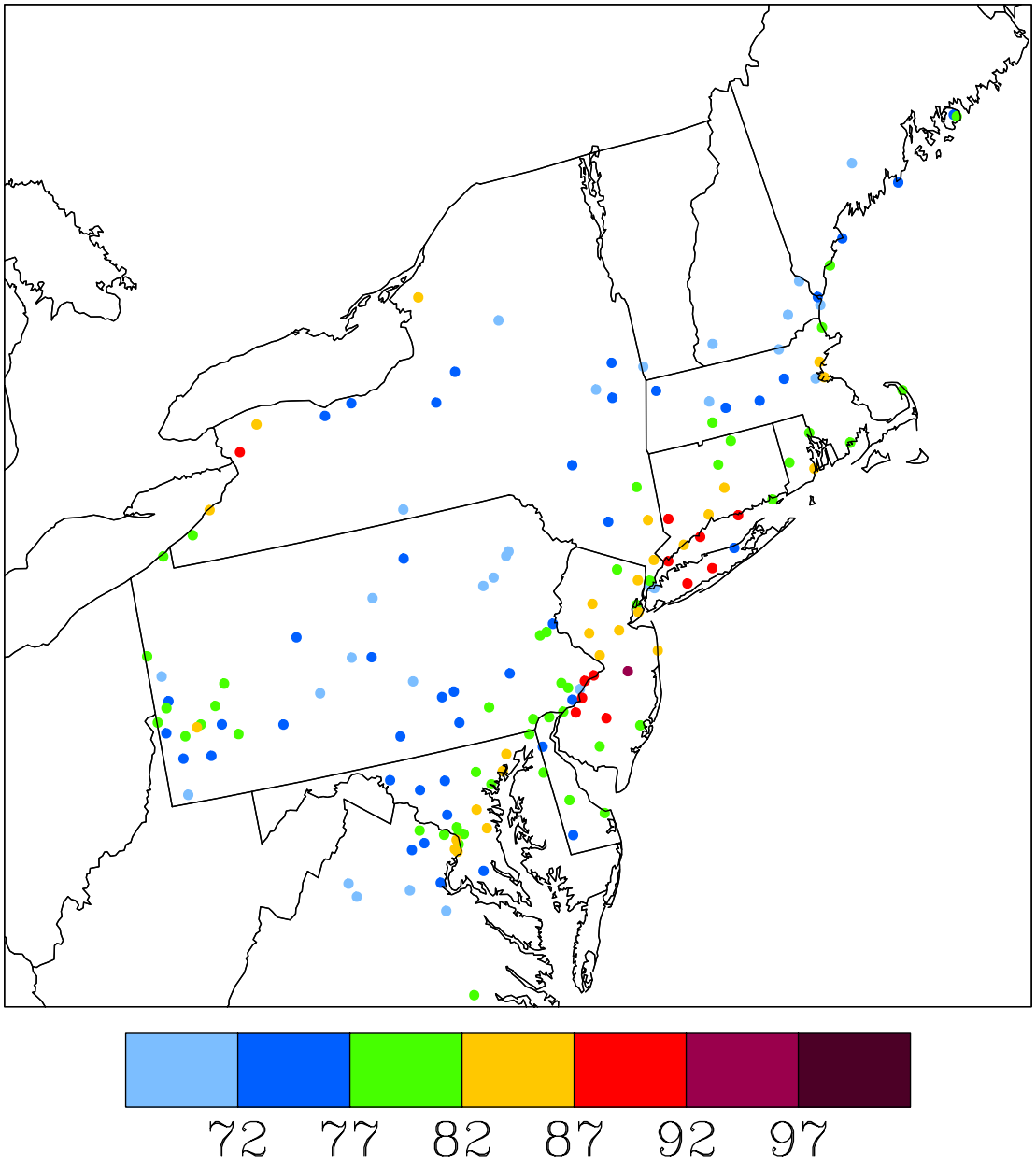
RRF = 2009 ave daily max/2002 ave daily max

Control Case Design Value (DV)

The 2009 control case ozone design value for each ozone monitoring station was determined by multiplying the 2002 base case ozone design value by the RRF calculated for each ozone monitor.

2009 DV = 2002 DV x RRF

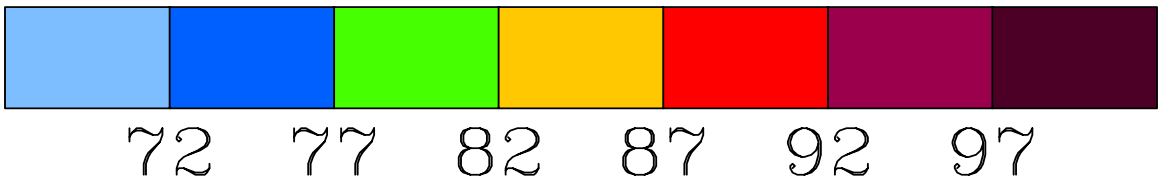
2009 Design Values in OTR



OTR Domain

2002 Design Values

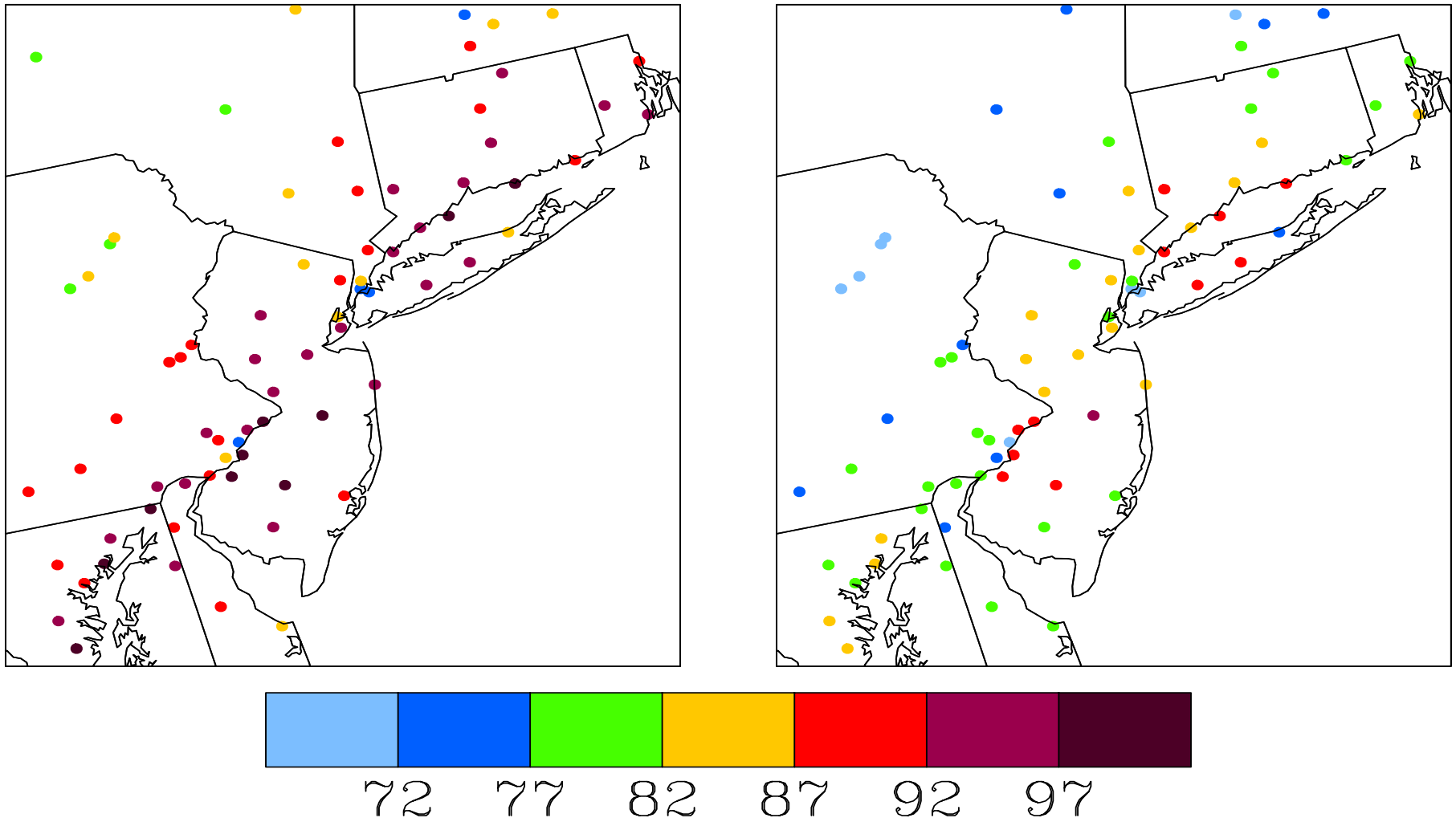
2009 Design Values



OTR Corridor

2002 Design Values

2009 Design Values



Findings for 2009 Base Case Run

- Design Values > 90 ppb at monitors in Connecticut, New York (Long Island), and New Jersey.
- Design Values > 85 ppb are confined to monitors in the inner OTR corridor with the exception of two monitors around Buffalo.
- A substantial portion of OTC corridor states are between 82 to 87 ppb. EPA requires a strong weight of evidence (WOE) analysis to support that 2009 control case design values will in fact be below 85 ppb by 2009.

Some Important Caveats

- OTR domain emissions have changed. CMAQ runs will be redone using version 3 of the MANEVU emission inventory and updated emission inventories for other RPO states.

- Canada 2002 emissions were used for both 2002 and 2009 CMAQ runs (probably conservative).

- CMAQ 4.4 was used. OTC Modeling Committee will use current state of the science model for the final attainment run (CMAQ 4.5?) Ozone predictions may change.

What This Tells Us

- OTW/OTB controls are helping, especially reductions from the NOx SIP call.
- Densely populated portions of the OTR are still non-attainment with the ozone NAAQS.
- More emission reductions are needed… everything is still on the table.

3. Next Steps

CMAQ Work in Progress

- MARAMA will complete the 2002 base case emission inventory (version 3) and prepare a 2009 OTB/OTW plus CAIR emission inventory (version 3).

- NYSDEC will redo the 2002 base case run using the MANEVU version 3 emission inventory and corresponding RPO emission inventories (by end of May?)

- NYSDEC will redo the 2009 base case run using MANEVU version 3 emission inventory and corresponding RPO emission inventories. If 2002 model performance with the version 3 emission inventory is OK, 2009 control case design values will be prepared (by end of June?)

Integrated SIP Modeling Schedule

Model Runs for Ozone, $PM_{2.5}$ and Regional Haze		**Emission Files**					**CMAQ Modeling**		
Status	**CMAQ Run ID**	**M-V**	**Vistas**	**MW RPO**	**SMOKE**	**Date**	**CMAQ vers**	**MCIP vers**	**Date**
Completed	2002 Base Case A	1	Base D	VISTAS Base D	NYDEC	Aug-05	4.4	2.3	Sep-05
Completed	2002 Base Case A1	1(corrected)	Base D	VISTAS Base D	NYDEC	Dec-05	4.4	2.3	Jan-06
Completed	2009 Base Case A1	2	Base D	VISTAS Base D	NYDEC	Jan-06	4.4	2.3	Feb-06
Completed	2018 Base Case A1	2	Base F	Base J	NESCAUM	20-Mar	4.4	2.3	In Progress

Model Runs for Ozone, $PM_{2.5}$ and Regional Haze		**Emission Files**					**CMAQ Modeling**		
Status	**CMAQ Run ID**	**M-V**	**Vistas**	**MW RPO**	**SMOKE**	**Date**	**CMAQ vers**	**MCIP vers**	**Date***
Do Next	2002 Base Case B	3	Base F	Base K	NYDEC	15-May	4.5	3	15-Jun
Do Next	2009 Control Case B	3	Base or Control G	Base or Control K	NYDEC	15-Jun	4.5	3	15-Jul
Do Next	2018 Control Case B	3	Base or Control G	Base or Control K	NESCAUM	15-Jun	4.5	3	15-Aug

*Delays may occur due to the non-availability of emission inventories